

- 1 1. An electrochemical cell, comprising:
2 a cathode;
3 an anode; and
4 a separator disposed between the cathode and the
5 anode, wherein the cathode comprises:
6 manganese dioxide; and
7 nonsynthetic, nonexpanded graphite particles
8 having an average particle size of less than about 20
9 microns.
- 1 2. The electrochemical cell according to claim 1,
2 wherein the nonsynthetic, nonexpanded graphite particles
3 have an average size of from about 2 microns to about 12
4 microns.
- 1 3. The electrochemical cell according to claim 1,
2 wherein the nonsynthetic, nonexpanded graphite particles
3 have an average size of from about 5 microns to about 9
4 microns.
- 1 4. The electrochemical cell according to claim 1,
2 wherein the cathode comprises at most about 10 percent
3 nonsynthetic, nonexpanded graphite particles by weight.
- 1 5. The electrochemical cell according to claim 1,
2 wherein the electrochemical cell is an alkaline battery.
- 1 6. The electrochemical cell according to claim 1,
2 wherein the electrochemical cell is selected from the group
3 consisting of AA batteries, AAA batteries, AAAA batteries, C
4 batteries and D batteries.

1 7. The electrochemical cell according to claim 1,
2 wherein the separator comprises a nonwoven, non-membrane
3 material and a second nonwoven, non-membrane material
4 disposed along a surface of the first material.

1 8. The electrochemical cell according to claim 1,
2 wherein the cathode has a porosity of from about 21% to
3 about 28%.

1 9. The electrochemical cell according to claim 1,
2 wherein the anode comprises zinc particles, and wherein the
3 anode has a porosity of from about 2 grams of zinc particles
4 to about 2.45 grams of zinc particles per cubic centimeter
5 of anode volume.

1 10. The electrochemical cell according to claim 1,
2 further comprising an electrolytic solution, wherein a
3 weight ratio of the manganese dioxide to the electrolytic
4 solution is from about 2.2 to about 2.9.

1 11. The electrochemical cell according to claim 1
2 further comprising an electrolytic solution, wherein the
3 anode comprises zinc particles and a weight ratio of the
4 zinc particles to the electrolytic solution is from about
5 0.9 to about 1.25.

1 12. A cathode, comprising:
2 manganese dioxide; and
3 nonsynthetic, nonexpanded graphite particles having
4 an average particle size of less than about 20 microns.

1 13. The cathode according to claim 12, wherein the
2 nonsynthetic, nonexpanded graphite particles have an average
3 size of from about 2 microns to about 12 microns.

1 14. The cathode according to claim 12, wherein the
2 nonsynthetic, nonexpanded graphite particles have an average
3 size of from about 5 microns to about 9 microns.

1 15. The cathode according to claim 12, wherein the
2 cathode comprises at most about 10 percent nonsynthetic,
3 nonexpanded graphite particles by weight.

1 16. The cathode according to claim 12, wherein the
2 cathode has a porosity of from about 21% to about 28%.